

U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
Division of Forest Insect Research

STUDY PLAN FOR TESTING AN ETHYLENE DIBROMIDE EMULSION
FOR
CONTROL OF THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE

Introduction

Penetrating oil solutions of ethylene dibromide have been used successfully in California for the control of several species of bark beetles. In Colorado, research led to the use of a water emulsion of ethylene dibromide in widespread operations against the Engelmann spruce beetle ^{1/}. Because of the bark similarity between Engelmann spruce and lodgepole pine, it is supposed that the emulsion will also work against bark beetles in lodgepole pine. It is proposed to test this assumption in conjunction with the 1956 bark-beetle control project in Dingley Creek, Yosemite National Park.

Objective and Justification

The objective of the test is to determine if the ethylene dibromide emulsion used to control the Engelmann spruce beetle in Colorado will give satisfactory control of the mountain pine beetle in lodgepole pine. If successful, the test may point to the use of the emulsion in at least some future control projects. The primary advantage of the emulsion, as compared to oil solutions, is that 85 percent less oil must be transported to the treating area; the remainder of the volume of the finished spray is water, which can generally be obtained relatively close to the point of application. In addition, the emulsion is less disagreeable to work with and for this reason is said to be preferred by treating crews.

Location of Work

This test will be made in the Dingley Creek infestation area, some 2 miles north of Tuolumne Meadows in Yosemite National Park. Fell-burn control will be in progress in this area at the same time.

Timing

The work should be done as soon as the Dingley Creek area becomes accessible, which will probably be about the end of May.

Procedure

1. Selection of trees.--Twelve average-size infested trees spotted for treatment in the control project will be selected for the test. Ten will be treated and two will be left for checks. An attempt will be made to choose the trees from varying sun-shade sites. The check trees will be burned prior to beetle emergence or treated with emulsion if the latter is effective.

^{1/} Massey, C. L., Chisholm, R. D., and Wygant, W. D. 1953. Chemical Control of the Engelmann Spruce Beetle in Colorado. Jour. Econ. Ent. 46(6):951-955.

2. Sampling.--Pre- and post-control samples of 0.5 square foot of bark will be taken from four sides of each tree at d.b.h. and 20 feet. Counts of live and dead insects will be recorded in the field. Post-control counts will be made at 1 week and 2 weeks after treatment; if satisfactory mortality is observed after 1 week the second count will be omitted.

3. Treatment.--The test trees will be felled and treated in the usual penetrating spray manner, using a garden-type sprinkling can and thoroughly wetting all the bark surface. The spray will be formulated as follows:

EDB	2.0 pints
Emulsifier	1.5 pints
Diesel Oil	1.5 gallons
Water to make	10 gallons

The emulsifier consists of 3 parts Triton X-100 and 5 parts Triton B-1956.

The emulsifiable concentrate will be prepared at a base location in the treating area, and the water will be added as close to the treating sites as possible. Five-gallon jeep cans will be used; 7 quarts of the emulsifiable concentrate will be put in each can, and the water will then be added. The resulting emulsion will then be poured into the sprinkling can and applied. It is estimated that about 10 gallons of spray will be sufficient for each tree.

Records

The following data will be recorded:

1. D.b.h. and infested length of each tree.
2. Location in sun or shade when felled.
3. Brood stages at treating time.
4. Numbers of live or dead insects in samples.
5. Amount of spray required per tree.

Equipment and Materials

Ethylene dibromide (85%)	5 gallons
Triton X-100	1 gallon
Triton B-1956	2 gallons
5-gallon jeep cans	0
Jeep-can nozzles	2
Watering cans	2
Quart oil cans	2
Cruiser's axe	1
Tweezers	1
Notebook, pencils, etc.	

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